

# (12) United States Patent Pfeiffer et al.

## (10) **Patent No.:** (45) Date of Patent:

US 9,409,839 B2

Aug. 9, 2016

### (54) REMOVAL OF IONIC LIQUIDS BY MEANS OF A KNITTED FABRIC

(71) Applicant: **BASF SE**, Ludwigshafen (DE)

Inventors: Daniel Pfeiffer, Neustadt (DE); Stefan

**Bitterlich**, Dirmstein (DE)

Assignee: **BASF SE** (DE)

(\*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35

U.S.C. 154(b) by 258 days.

(21) Appl. No.: 13/937,395

Jul. 9, 2013 (22)Filed:

#### (65)**Prior Publication Data**

US 2014/0018596 A1 Jan. 16, 2014

### Related U.S. Application Data

(60) Provisional application No. 61/670,140, filed on Jul. 11, 2012.

(51) Int. Cl. C07C 7/144 (2006.01)

(52) U.S. Cl. CPC ...... C07C 7/144 (2013.01); C07C 2101/14 (2013.01)

### (58) Field of Classification Search

See application file for complete search history.

#### (56)References Cited

### U.S. PATENT DOCUMENTS

3,271,467	A	9/1966	Nakayama
3,406,217	A	10/1968	Davison et al.
6,503,465	B1	1/2003	Lin et al.
2003/0109767	A1	6/2003	Vasina et al.
2011/0137097	A1	6/2011	Tschirschwitz et al

#### 2011/0137098 A1 6/2011 Tschirschwitz et al. 2011/0155632 A1 6/2011 Timken et al. 2011/0155640 A1 6/2011 Timken et al.

#### FOREIGN PATENT DOCUMENTS

EP	1503236 A1	2/2005
WO	WO-2010062922 A2	6/2010
WO	WO-2010074836 A2	7/2010
WO	WO-2010075038 A2	7/2010
WO	WO-2011069929 A1	6/2011
WO	WO-2011069957 A1	6/2011
WO	WO-2012104769 A1	8/2012

#### OTHER PUBLICATIONS

U.S. Appl. No. 61/438,686, filed Feb. 2, 2011. U.S. Appl. No. 61/670,130, filed Jul. 11, 2012.

(Continued)

Primary Examiner — Tam M Nguyen (74) Attorney, Agent, or Firm — Drinker Biddle & Reath LLP

#### (57)ABSTRACT

The present invention relates to a process for separating a phase (A) comprising at least one ionic liquid from a phase (B), phase (A) having a higher viscosity than phase (B), comprising the following steps:

- a) providing a stream (S1) comprising a dispersion (D1) in which phase (A) is dispersed in phase (B).
- b) introducing stream (S1) into a phase separation unit (PT1) comprising a knitted fabric, preferably a knitted glass fiber fabric,
- c) separating the dispersed phase (A) from phase (B) in the phase separation unit (PT1),
- d) discharging a stream (S2) comprising at least 70% by weight, preferably at least 90% by weight, of phase (A) from the phase separation unit (PT1), and
- e) discharging a stream (S3) comprising at least 70% by weight, preferably at least 90% by weight, of phase (B) from the phase separation unit (PT1).

### 21 Claims, 1 Drawing Sheet

